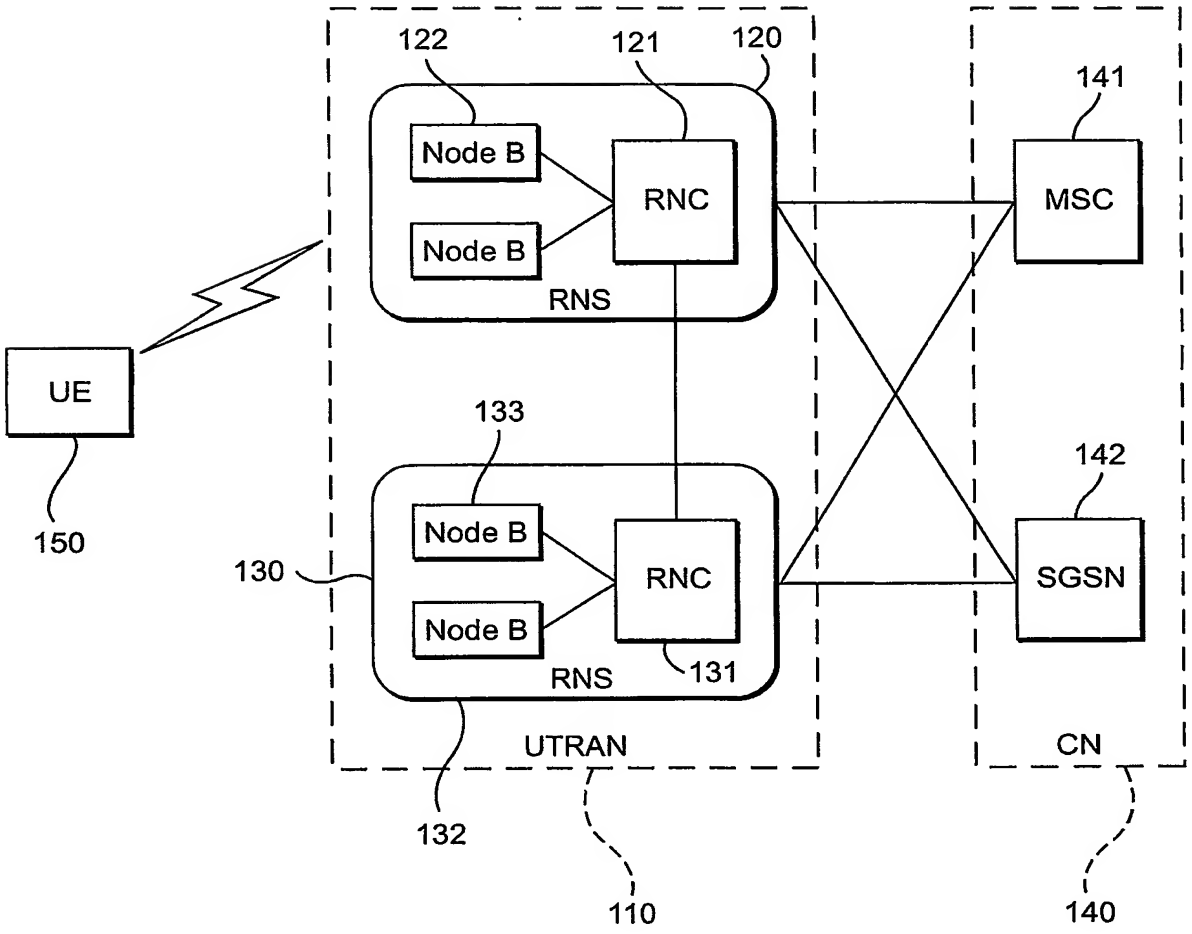
122
121
120
141
Node B
Node B
RNC
MSC
RNS
UE
133
142
Node B
Node B
RNC
SGSN
130
RNS
131
UTRAN
CN
150
132
110
140

Fig. 1

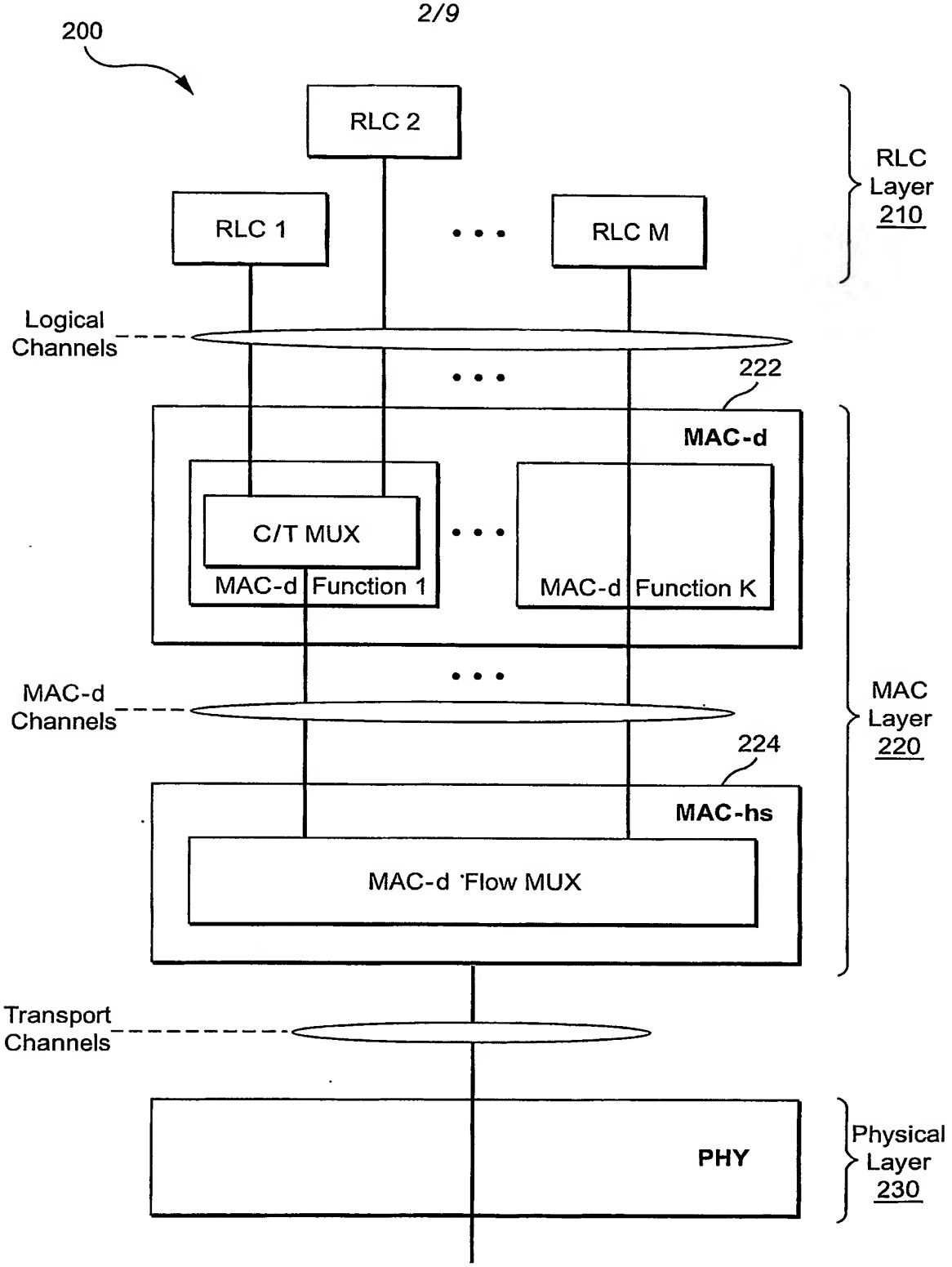
200
RLC 2
RLC 1
RLC M
RLC Layer 210
Logical Channels
222
MAC-d
C/T MUX
MAC-d Function 1
MAC-d Function K
MAC-d Channels
MAC Layer 220
224
MAC-hs
MAC-d Flow MUX
Transport Channels
PHY
Physical Layer 230

Fig. 2

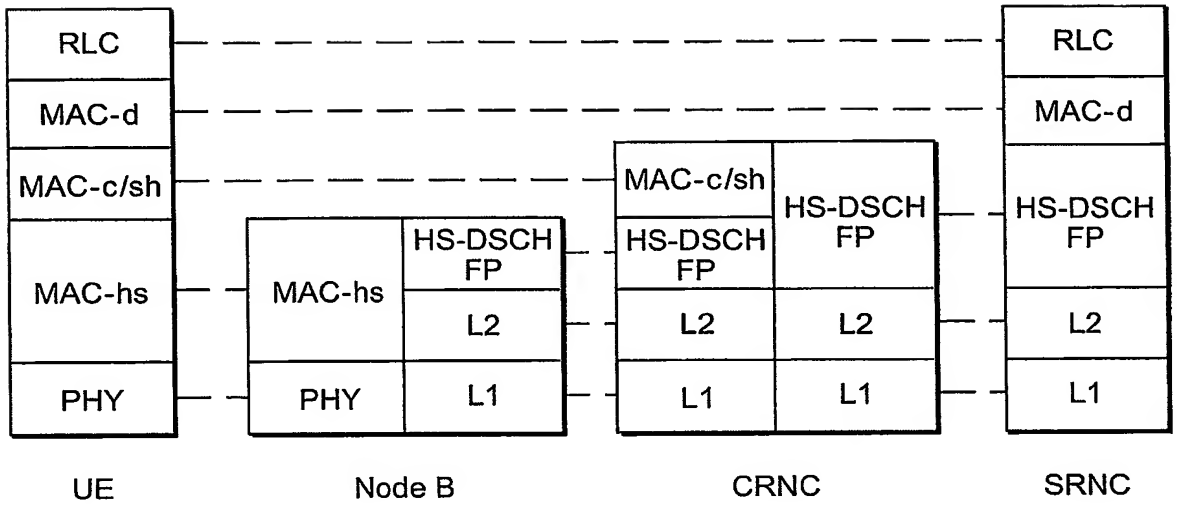
RLC
MAC-d
MAC-c/sh
MAC-hs
PHY
MAC-hs
HS-DSCH FP
L2
PHY
L1
MAC-c/sh
HS-DSCH FP
L2
L1
HS-DSCH FP
L2
L1
RLC
MAC-d
HS-DSCH FP
L2
L1
UE
Node B
CRNC
SRNC

Fig. 3

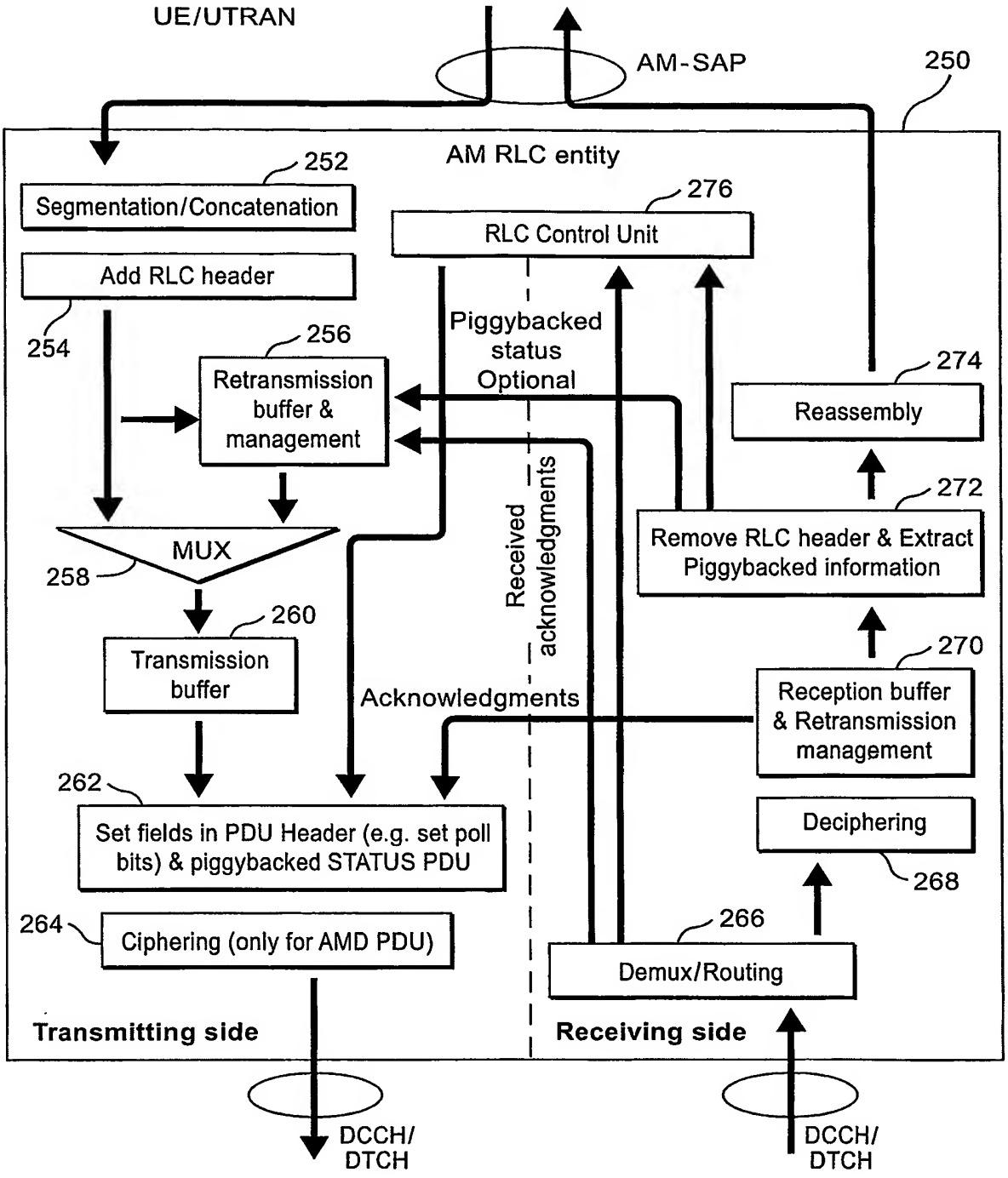
UE/UTRAN
AM-SAP
250
AM RLC entity
252
Segmentation/Concatenation
276
RLC Control Unit
Add RLC header
254
256
Retransmission buffer & management
Piggybacked status Optional
274
Reassembly
272
Remove RLC header & Extract Piggybacked information
MUX
258
Received acknowledgments
260
Transmission buffer
270
Reception buffer & Retransmission management
Acknowledgments
262
Set fields in PDU Header (e.g. set poll bits) & piggybacked STATUS PDU
Deciphering
268
264
Ciphering (only for AMD PDU)
266
Demux/Routing
Transmitting side
Receiving side
DCCH/ DTCH
DCCH/ DTCH

Fig. 4

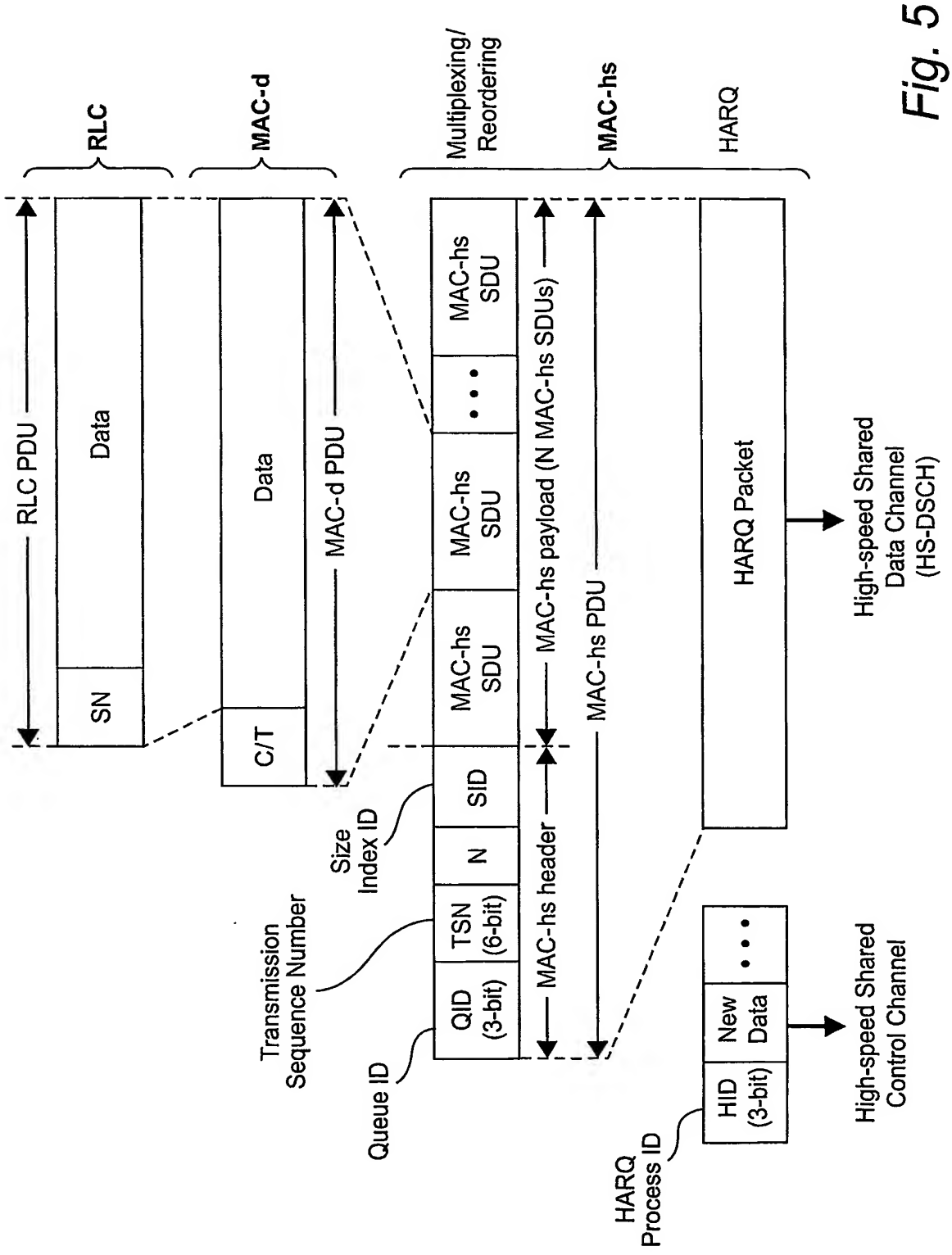
RLC
MAC-d
Multiplexing/ Reordering
MAC-hs
HARQ
RLC PDU
Data
SN
Data
C/T
MAC-d PDU
MAC-hs SDU
MAC-hs SDU
MAC-hs SDU
MAC-hs payload (N MAC-hs SDUs)
MAC-hs PDU
HARQ Packet
High-speed Shared Data Channel (HS-DSCH)
Size Index ID
SID
N
TSN (6-bit)
QID (3-bit)
Transmission Sequence Number
Queue ID
MAC-hs header
HID (3-bit)
New Data
HARQ Process ID
High-speed Shared Control Channel

Fig. 5

AM RLC PDU Header

AMD (Data) PDU

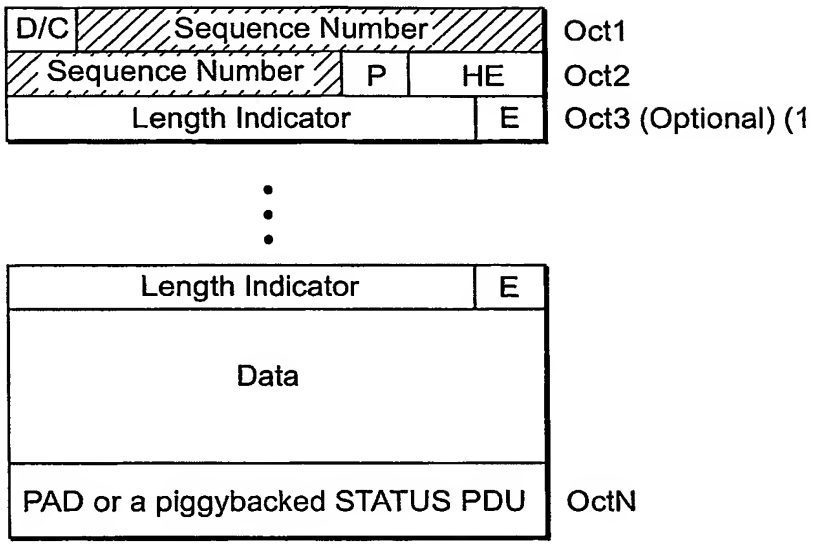

Fig. 6

Control PDU

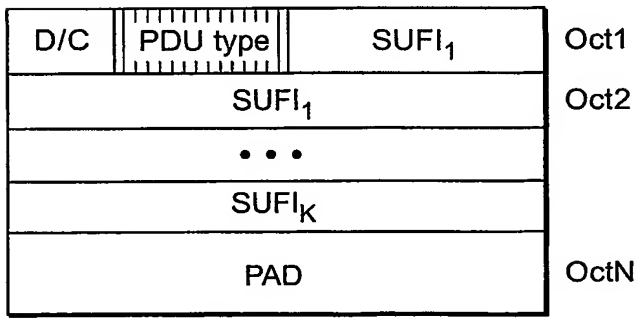

Fig. 7

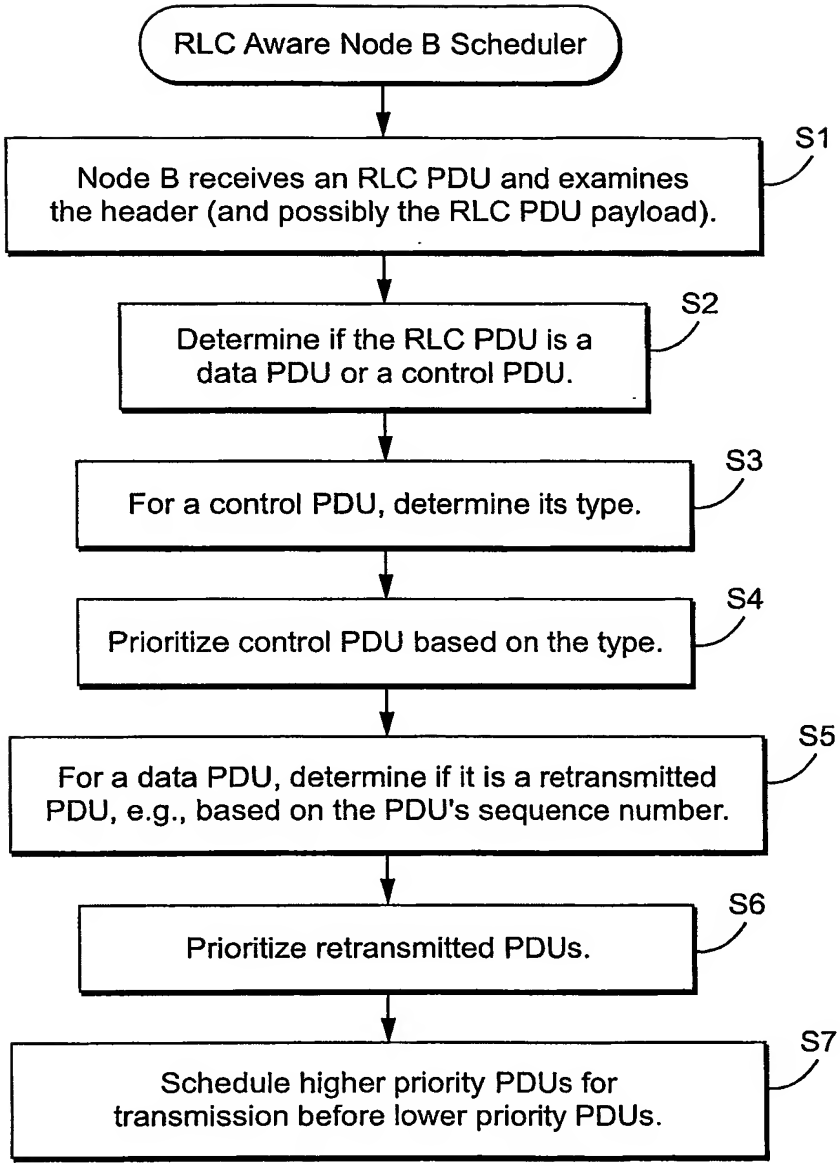
RLC Aware Node B Scheduler
Node B receives an RLC PDU and examines the header (and possibly the RLC PDU payload).
S1
Determine if the RLC PDU is a data PDU or a control PDU.
S2
For a control PDU, determine its type.
S3
Prioritize control PDU based on the type.
S4
For a data PDU, determine if it is a retransmitted PDU, e.g., based on the PDU's sequence number.
S5
Prioritize retransmitted PDUs.
S6
Schedule higher priority PDUs for transmission before lower priority PDUs.
S7

Fig. 8

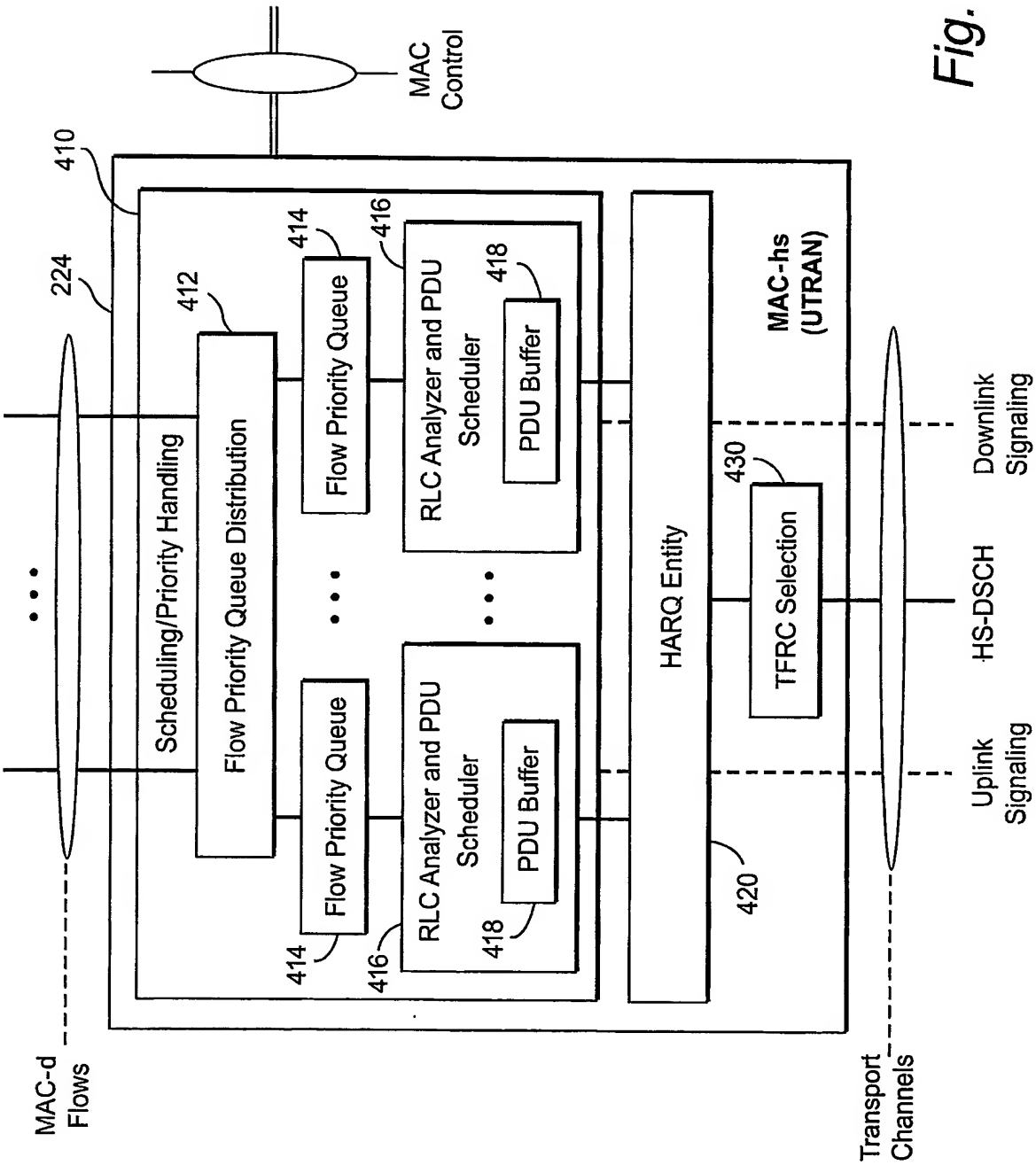
MAC Control
410
224
412
414
416
418
Scheduling/Priority Handling
Flow Priority Queue Distribution
Flow Priority Queue
RLC Analyzer and PDU Scheduler
PDU Buffer
HARQ Entity
TFRC Selection
430
420
MAC-hs (UTRAN)
MAC-d Flows
Transport Channels
Uplink Signaling
HS-DSCH
Downlink Signaling

Fig. 9

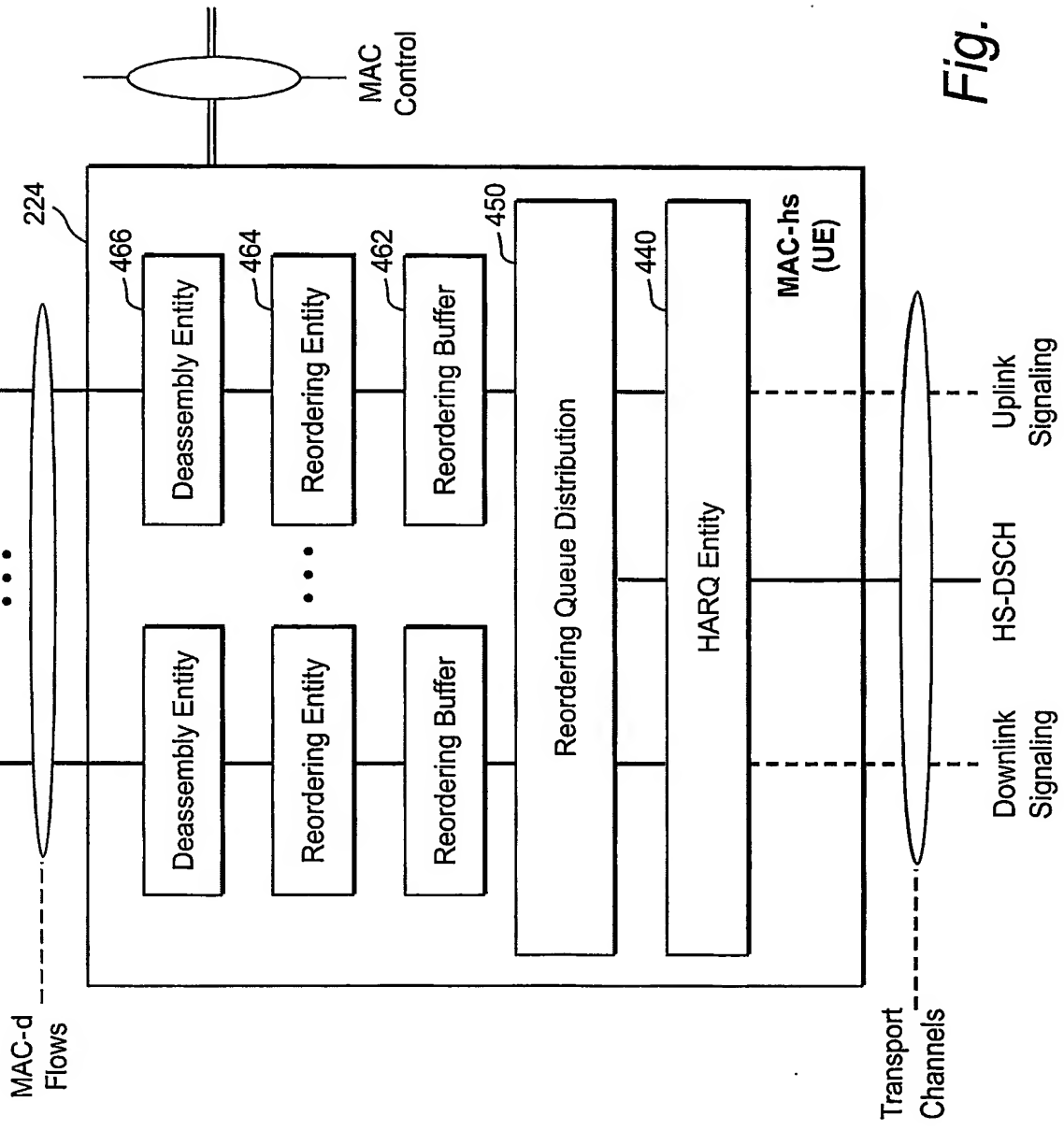
MAC Control
224
466
464
462
450
440
MAC-hs (UE)
Deassembly Entity
Reordering Entity
Reordering Buffer
Reordering Queue Distribution
HARQ Entity
Deassembly Entity
Reordering Entity
Reordering Buffer
MAC-d Flows
Transport Channels
Uplink Signaling
HS-DSCH
Downlink Signaling

Fig. 10